

Notice of Allowability

Application No.

10/775,772

Examiner

Stephen Rosasco

Applicant(s)

KIM ET AL.

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Election 9/21/06.
2. ☒ The allowed claim(s) is/are 1-38.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 2/9/04,4/7/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

ALLOWANCE

Applicant's election without traverse of Group I (claims 1-38) in the reply filed on 9/21/06 is acknowledged.

An *examiner's amendment* to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Cancel claims 39-70.

Authorization for this examiner's amendment was given by virtue of the election without traverse to the restriction requirement.

The following is an examiner's statement of reasons for allowance: the claimed invention is distinguished over the prior art of record in that the prior art does not teach a photomask comprising: a pattern of radiation blocking regions on at least one of the first and/or second surfaces of a transparent substrate, and an array of shadowing elements within the transparent substrate between the first and second opposing surfaces wherein a shadowing element of the array has a light transmittance characteristic different than that of an adjacent portion of the transparent substrate and wherein a transmittance of the patterning radiation through a portion of the transparent substrate including the array of shadowing elements is greater than approximately 20%.

Thony et al. (2005/0158634) teach (see claims) a mask including a transparent substrate, wherein at least one absorber/phase shifter element is embedded in the substrate.

Thony et al. also teach (see section [0052]) that the interstices between absorber/phase shifter elements are then filled with an infill material 114 that may be transparent or semi-transparent such as molten silica or molten silica modified by the addition of chlorinated or fluorinated compounds. This infill material may also be an organo-mineral glass deposited in solution in a solvent, by centrifuging and annealed (sol-gel process). The choice of this material is not particularly critical. The thickness of the absorber/phase shifter elements 112, and therefore of the infill material, is usually small. Thus, the infill material does not absorb a large quantity of insolation light. It is thus possible to choose a quasi-transparent or transparent infill material. After planing the infill material, for example using a mechanical-chemical polishing process, the first part of the substrate 110 is assembled with the second part of the substrate 120, also called the superstrate, so as to cover the absorber/phase shifter elements 112.

However, Thony et al. does not teach the use of radiation blocking regions on the substrate in addition to the shadowing elements within the substrate as shown in FIG. 3. And while differences in transmittance in absolute terms may be relatively small with all regions of the substrate providing a transmittance of greater than 97% for the patterning radiation 321, by adding the arrays of shadowing elements, the uniformity of critical dimensions in the photosensitive layer 301 being patterned can be improved as shown by the dashed lines.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 1756

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'S. Rosasco', with a stylized, sweeping flourish extending from the end of the name.

S. Rosasco
Primary Examiner
Art Unit 1756

S. Rosasco
10/23/06